Scholar Journal of Commerce and Management
Vol. 02, Issue. 03, pp. 77-84, Jul - Sep 2026
https://doi.org/10.65219/sjcm.20260203012

ROLE OF ARTIFICIAL INTELLIGENCE AND DIGITAL TECHNOLOGIES IN EMPOWERING RURAL WOMEN AGRIPRENEURS: A STUDY IN RAMANATHAPURAM DISTRICT

J. Jeya Ani[1*], C. Parvathi[2]

1. Asst. Professor, Department of Commerce, St. Xavier's College (Autonomous), Palayamkottai, Tamil Nadu, India
2. Asst. Professor, Department of Commerce, Morning Star Arts and Science College for Women, Pasumpon, India

Abstract

Rural women contribute significantly to household income and livelihood growth through agriculture and allied activities. However, their entrepreneurial development is constrained by limited access to markets, finance, information, technology, training and digital resources. The expansion of artificial intelligence (AI) and digital technologies provides opportunities for rural women agripreneurs to improve productivity, access market information, communicate with customers, identify business opportunities and manage financial transactions. This study examines the role of AI and digital technologies in empowering rural women agripreneurs in Ramanathapuram District, Tamil Nadu. It focuses on their socio-economic characteristics and their awareness, access to and use of smartphones, internet services, digital platforms, AI applications, digital payments and technology-enabled business practices, and considers how technology adoption contributes to empowerment through confidence, participation in decision-making, financial independence and livelihood enhancement, as well as the major barriers to adoption. Primary data were collected from 500 rural women agripreneurs using a structured questionnaire and analysed using frequency and percentage analysis and Pearson's correlation. Awareness of digital technologies was positively and significantly correlated with smartphone use ($r = 0.626$) and internet use ($r = 0.638$) for agribusiness, and smartphone use was correlated with internet use ($r = 0.661$), all at $p < 0.001$. The study provides insights for policymakers, government agencies, financial institutions, NGOs and other stakeholders to develop effective digital literacy, training, financial support and market-access initiatives for sustainable rural women's agripreneurship.

Keywords

Artificial Intelligence, Digital Technologies, Rural Women, Agripreneurship, Women Empowerment, Digital Adoption, Livelihood Enhancement, Digital Literacy

1. Introduction

A significant portion of India's rural population depends on agriculture and allied activities, which are vital to the rural economy (Food and Agriculture Organization [FAO], 2023). Rural women are actively engaged in crop cultivation, cattle and poultry rearing, horticulture, food processing and other income-generating activities, and in recent years many have progressively moved from being agricultural workers to becoming agripreneurs running agriculture-related business ventures (Atmakuri et al., 2025; Deshmukh et al., 2024; Sheeba & Raj, 2024). However, women agripreneurs still face several obstacles, such as a lack of funding, technical expertise, training, market access, information and institutional support.

The rapid advancement of digital technologies and AI has opened new possibilities for agriculture and entrepreneurship (Khwidzhilli & Ijatuyi, 2026; Majiwa et al., 2026). Smartphones, internet services, digital payment systems, social media, online marketplaces, mobile applications and AI-based tools can help women agripreneurs gather agricultural

*Corresponding author: parvathichandran0507@gmail.com

and weather-related information, determine market prices, promote products, communicate with customers and handle commercial transactions (Annamalai et al., 2026; Singh, 2026). Digital technologies can also lower geographical barriers and increase rural women's access to markets and information, and effective participation in them can foster business growth while enhancing empowerment and livelihoods through greater confidence, participation in decision-making and financial independence (Kannur, 2026; Rice et al., 2023; Sajanapwar & Chandratreya, 2024). Conversely, digital exclusion, inadequate digital skills, lack of training, unreliable internet access, high technology costs and limited understanding of AI applications may hinder adoption among rural women (Duvendack et al., 2023; Kulkarni & Ghosh, 2021; Maheshwari et al., 2025).

1.1 Statement of the problem: Rural women play an important role in dairy farming, poultry farming, goat and sheep rearing, vegetable and fruit cultivation and food processing, which contribute to household income. However, they often face difficulties in accessing information, markets, finance, training, customers and modern technology. Smartphones, internet services, digital payments, online marketing platforms and AI-based applications can give them access to agricultural data, market prices, product promotion, customer outreach and business-management support (A & Aram, 2025; Yomi, 2024), but their adoption may be affected by differences in digital awareness, training, internet connectivity, affordability and technological knowledge (Dey & Das, 2025; Tzachor, 2021).

1.2 Need for the study: Ramanathapuram District has a substantial rural population engaged in agriculture and allied activities. It is therefore important to evaluate the awareness, use, benefits, difficulties and empowerment outcomes of AI and digital technologies among rural women agripreneurs in the district. The results can help identify strategies for enhancing their digital skills, business prospects and livelihood development and for designing appropriate programmes for digital literacy, training, financial support, market linkage and institutional support.

2. Objectives of the Study

1. To study the socio-economic characteristics of rural women agripreneurs in Ramanathapuram District and their awareness of and access to digital technologies and AI.
2. To examine the use of AI and digital technologies in agribusiness and their role in empowering women and improving their livelihoods.
3. To identify the main obstacles rural women agripreneurs face in adopting digital and AI technologies.
4. To determine their willingness to continue using AI and digital technologies to grow their businesses.

3. Hypotheses of the Study

- **H01:** There is no significant correlation between rural women agripreneurs' awareness of digital technologies and their use of these technologies in agribusiness activities.
- **H02:** There is no significant correlation between the use of AI and digital technologies and women's empowerment.
- **H03:** The use of AI and digital technologies does not significantly affect rural women agripreneurs' standard of living.
- **H04:** There is no significant correlation between the socio-economic characteristics of rural women agripreneurs and their adoption of AI and digital technologies.
- **H05:** There is no significant relationship between the difficulties faced by rural women agripreneurs and their willingness to continue using AI and digital technologies.

4. Review of Literature

Sajjad et al. (2020) analysed the factors affecting women's entrepreneurial endeavours and emphasised the significance of institutional support, networks, information and access to resources; technology-enabled access to business resources and information can enhance entrepreneurial opportunities, although socio-economic constraints and lack of support may prevent women from taking full advantage of them. Gammage et al. (2017) examined

the connection between women's economic opportunities and digital financial services, showing that access to financial services helps women save, make payments and manage their finances, although institutional, financial and social barriers may limit access. Both studies suggest that digital technologies and digital financial services may increase rural women's involvement in entrepreneurship and help them manage business transactions.

Klerkx et al. (2019) found that digital technologies can enhance agricultural information, communication, knowledge and decision-support services, although unequal access to infrastructure, skills and technology can hamper adoption. Fabregas et al. (2019) showed that digital agricultural extension can supplement conventional extension systems and deliver agricultural knowledge more effectively, with effectiveness depending on user capabilities, information quality and accessibility. Liakos et al. (2018) reviewed AI and machine-learning methods in agriculture and showed their potential for crop management, agricultural prediction, disease detection and decision-making, provided that appropriate data, technical infrastructure and user expertise are available. Aker et al. (2016) established that mobile-based communication can improve access to agricultural and market information and reduce information barriers, with benefits depending on infrastructure, cost and users' capacity. These findings indicate that digital and AI-based tools may help rural women agripreneurs make informed decisions and overcome information and market-related barriers.

Sutherland and Jarrahi (2018) emphasised that digital platforms link business owners with clients, information and financial prospects, enabling new types of entrepreneurial activity and reducing geographical limitations, while Nambisan (2017) described how digital technologies change business models, opportunities and entrepreneurial processes and help entrepreneurs connect with external stakeholders. Hilbert (2011) showed that socio-economic circumstances shape gender disparities in access to and use of information and communication technologies, and that access alone does not guarantee meaningful use; the benefits women derive depend on their skills, education and socio-economic status. Kabeer (2012) emphasised the role of resources, agency and achievements in understanding empowerment, noting that economic opportunities alone may not empower women unless they can access, manage and make decisions about resources. Together, these studies underline the importance of examining how technology adoption, entrepreneurial participation, decision-making and livelihood outcomes contribute to the empowerment of rural women in agribusiness.

4.1 Research gap: Most existing studies concentrate on farmers, rural entrepreneurs or women entrepreneurs in general, and relatively little attention has been given specifically to landless rural women agripreneurs. Digital technologies and AI have mostly been studied separately rather than in combination, and prior research has focused mainly on technology adoption, agricultural productivity or financial inclusion, with less attention to livelihood enhancement, income improvement, entrepreneurial participation and decision-making among rural women. Factors such as digital literacy, education, family support, access to finance, awareness and training have not been examined collectively in this context, and empirical evidence specific to Ramanathapuram District is limited. The present study seeks to address these gaps by examining how digital technologies and AI can support the livelihoods and entrepreneurial ventures of rural women agripreneurs in the district.

5. Conceptual Framework

The conceptual framework describes how digital technologies, AI and the empowerment of rural women agripreneurs are related, focusing on how awareness and use of digital technology may support agribusiness operations, improve market and information access and create more livelihood options.

Socio-economic profile: Age, educational qualification, marital status, type of agripreneurial activity and monthly income may influence women's awareness, access to and use of AI and digital technologies, and understanding these characteristics helps explain differences in adoption and its

contribution to business and livelihood development.

Awareness and access: Awareness of digital technologies, use of smartphones and internet services for agribusiness and awareness of AI applications in agriculture and business are fundamental to effective adoption, enabling women to obtain information and use technology more efficiently.

Role of AI and digital technologies: These technologies can support rural women agripreneurs in obtaining agricultural and weather information, identifying market prices, promoting products, reaching customers and markets, making digital payments and saving time in business management.

Women's empowerment: The study considers whether the use of AI and digital technologies increases women's confidence in managing their agribusiness, strengthens their participation in business decision-making and improves their financial independence.

Challenges in adoption: Lack of digital knowledge, insufficient training, poor internet connectivity, high technology costs and lack of awareness may restrict effective use and prevent women from obtaining the full benefits of AI and digital technologies.

Government support and future adoption: Training programmes, digital literacy initiatives, financial assistance, infrastructure development and awareness programmes may encourage adoption, and the study considers the perceived importance of such support and women's willingness to continue using these technologies.

6. Research Methodology

The study adopted a descriptive and analytical research design and is confined to Ramanathapuram District, Tamil Nadu. The population consists of rural women agripreneurs engaged in activities such as dairy farming, poultry farming, goat and sheep rearing, vegetable and fruit cultivation and food processing who use, have access to or are aware of smartphones, internet services, digital platforms or other digital technologies for their agribusiness activities. A convenience sampling technique was used, with respondents selected on the basis of their participation in agripreneurial activities, availability and willingness to participate, and the sample comprises 500 rural women agripreneurs. Primary data were collected through a structured questionnaire covering socio-economic profile, awareness of digital technologies and AI, technology use, empowerment and livelihood enhancement; secondary data were drawn from books, journals, government publications, reports and websites. The data were coded and analysed using IBM SPSS Statistics. Frequency and percentage analysis was used to describe the respondents' profile, and Pearson's correlation was used to examine the relationships among awareness of digital technologies (coded HWRADT), smartphone use for agribusiness (HOSYAA) and internet use for agribusiness (HOYIYAA).

7. Data Analysis and Interpretation

Table 1. Educational Qualification of the Respondents

S. No.	*Educational qualification*	*Frequency*	*Percentage (%)*
1	Illiterate	28	5.6
2	Primary education	88	17.6
3	Secondary education	92	18.4
4	Higher secondary	206	41.2
5	Graduate and above	79	15.8
6	No response	7	1.4
	Total	500	100.0

Source: Primary data

Table 1 shows that 41.2% of the respondents have a higher secondary education, while 5.6% are

illiterate. In general, the majority of respondents have at least a basic education.

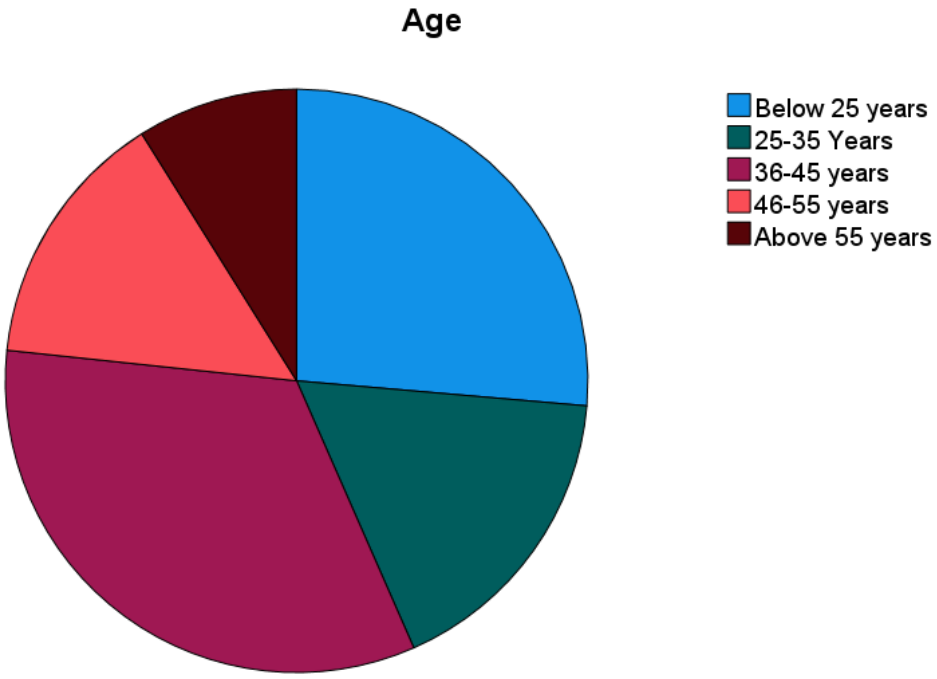


Figure 1. Age-wise Distribution of Respondents

Figure 1 shows that the largest group of respondents is aged 36–45 years, followed by those below 25 years and those aged 25–35 years. Respondents aged 46–55 years form a smaller share, and those above 55 years form the smallest group. Overall, the respondents come from a variety of age groups.

Table 2. Pearson Correlation among Awareness of Digital Technologies, Smartphone Use and Internet Use

Variable	*Statistic*	*Awareness (HWRADT)*	*Smartphone use (HOSYAA)*	*Internet use (HOYIYAA)*
Awareness (HWRADT)	Pearson correlation	1	.626**	.638**
	Sig. (2-tailed)	—	< .001	< .001
	N	500	500	500
Smartphone use (HOSYAA)	Pearson correlation	.626**	1	.661**
	Sig. (2-tailed)	< .001	—	< .001
	N	500	500	500
Internet use (HOYIYAA)	Pearson correlation	.638**	.661**	1
	Sig. (2-tailed)	< .001	< .001	—
	N	500	500	500

*Source: Primary data; ** correlation is significant at the 0.01 level (2-tailed).*

Table 2 shows a positive and significant correlation between awareness of digital technologies and smartphone use ($r = .626$, $p < .001$), between awareness and internet use ($r = .638$, $p < .001$), and between smartphone use and internet use ($r = .661$, $p < .001$). Hence, H01 is rejected.

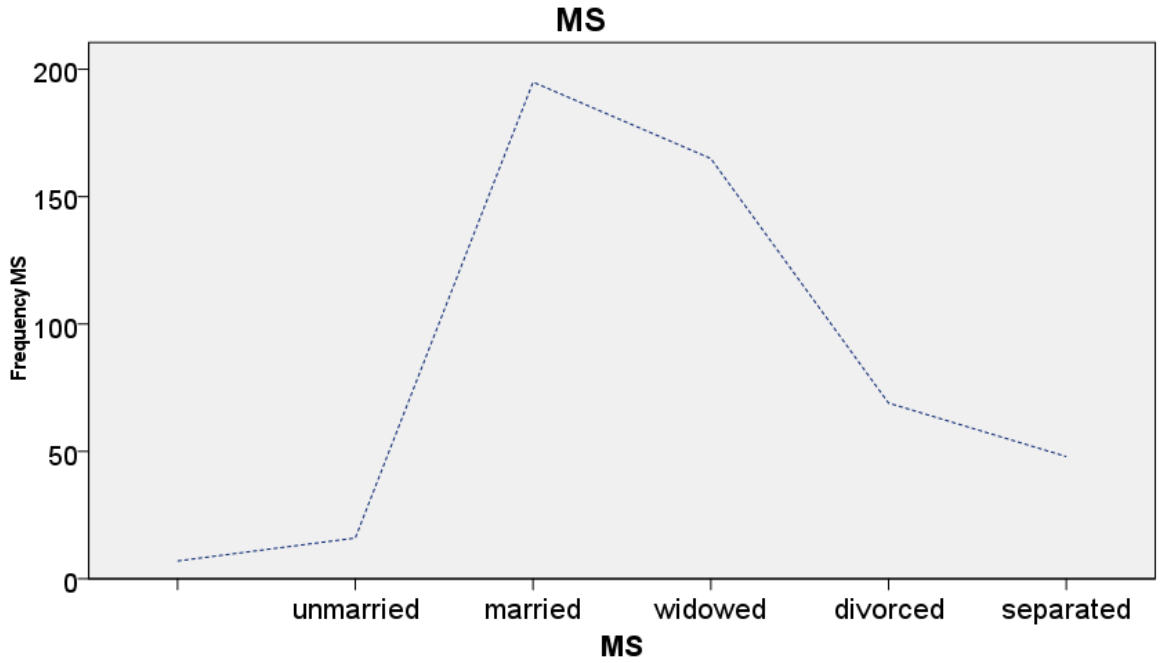


Figure 2. Distribution of Respondents by Marital Status

Figure 2 shows that married respondents form the largest group, followed by widowed respondents, while divorced and separated respondents form smaller groups and unmarried respondents the smallest group.

8. Findings and Discussion

1. The respondents' educational backgrounds vary widely: 41.2% have completed higher secondary education, 18.4% secondary education and 17.6% primary education, 15.8% are graduates or above, and 5.6% are illiterate.

2. The 36–45 age group forms the largest share of respondents, and married women form the largest group by marital status, providing useful context for understanding the respondents' involvement in agribusiness.

3. Awareness of digital technologies was measured on a five-point scale (very low to very high): 32.6% of respondents reported a high and 16.6% a very high level of awareness, indicating that a sizeable proportion are aware of digital technologies.

4. In all, 46.2% of respondents use smartphones frequently and 16.6% very frequently for agribusiness purposes, showing that the smartphone is a crucial digital tool for their activities; internet use for agribusiness (measured as never, rarely, sometimes, often and very often) varies across respondents.

5. Awareness of digital technologies is positively and significantly correlated with smartphone use ($r = 0.626$) and internet use ($r = 0.638$), and smartphone use is correlated with internet use ($r = 0.661$), all at $p < 0.001$. Respondents with greater understanding of digital technology therefore make greater use of smartphones and the internet for agribusiness, which provides a foundation for further research on digital technology and rural women's empowerment.

9. Conclusion

Digital technologies play an important role in helping rural women agripreneurs with their agricultural and agribusiness activities. Differences in digital awareness and educational level influence women's exposure to and use of digital technology,

and the sizeable share of respondents aware of digital technologies shows how important digital tools are becoming for rural agricultural operations. Rural women agripreneurs use smartphones and the internet to obtain agricultural information, access digital services and business resources and engage with stakeholders and customers, which gives them the opportunity to manage their ventures better and improve their standard of living. The positive correlations among awareness of digital technology, smartphone use and internet use suggest that greater understanding of digital technologies is linked to greater use of these tools for agricultural activities.

The study therefore emphasises the need to improve rural women agripreneurs' digital literacy, awareness, training and access to digital resources. Appropriate digital literacy programmes and hands-on training can help women use smartphones, the internet and other digital technologies more effectively, and better access to digital resources can support their commercial activities, strengthen livelihoods, increase income and empower women, enabling greater participation in technology-enabled agribusiness and rural economic development.

References

[1]. A, R., & Aram, M. (2025). Artificial intelligence adoption in non-chemical agriculture: An integrated mechanism for sustainable practices. Sustainability.

[2]. Aker, J. C., Ghosh, I., & Burrell, J. (2016). The promise (and pitfalls) of ICT for agriculture initiatives. Agricultural Economics, 47(S1), 35–48. https://doi.org/10.1111/agec.12301

[3]. Annamalai, S., et al. (2026). Harvesting innovation: Women agripreneurs revolutionising with technology. In CABI eBooks. CABI.

[4]. Atmakuri, S., et al. (2025). Seeds of change: Empowering women agri-entrepreneurs in India through key drivers. Journal of Information and Optimization Sciences.

[5]. Deshmukh, P., et al. (2024). Women's agripreneurship in India's Maharashtra State: An analysis of the AC and ABC Scheme. Current Agriculture Research Journal.

[6]. Dey, S., & Das, S. (2025). Empowering rural women through financial innovation: A structured literature review of Indian studies. Siddhant – A Journal of Decision Making.

[7]. Duvendack, M., et al. (2023). Gender inclusivity of India's digital financial revolution for attainment of SDGs: Macro achievements and the micro experiences of targeted initiatives. European Journal of Development Research.

[8]. Fabregas, R., Kremer, M., & Schilbach, F. (2019). Realizing the potential of digital development: The case of agricultural advice. Science, 366(6471), Article eaay3038. https://doi.org/10.1126/science.aay3038

[9]. Food and Agriculture Organization of the United Nations. (2023). The status of women in agrifood systems. FAO. https://doi.org/10.4060/cc5343en

[10]. Gammage, S., Kes, A., Winograd, L., Sultana, N., Hiller, S., & Bourgault, S. (2017). Gender and digital financial inclusion: What do we know and what do we need to know? International Center for Research on Women.

[11]. Hilbert, M. (2011). Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics. Women's Studies International Forum, 34(6), 479–489. https://doi.org/10.1016/j.wsif.2011.07.001

[12]. Kabeer, N. (2012). Women's economic empowerment and inclusive growth: Labour markets and enterprise development (SIG Working Paper 2012/1). Department for International Development and International Development Research Centre.

[13]. Kannur, S. (2026). Mobile banking, UPI and digital wallets for women's empowerment: An Indian perspective. Journal of Emerging Technologies and Innovative Research.

[14]. Khwidzhilli, T., & Ijatuyi, E. J. (2026). Leveraging digital tools for sustainable precision in Agriculture 3.0–5.0: A scoping review of trends, benefits, and challenges. Frontiers in Sustainable Food Systems.

[15]. Klerkx, L., Jakku, E., & Labarthe, P. (2019). A review of social science on digital agriculture, smart farming and Agriculture 4.0: New contributions and a future research agenda. NJAS – Wageningen Journal of Life Sciences, 90–91, Article 100315. https://doi.org/10.1016/j.njas.2019.100315

[16]. Kulkarni, L., & Ghosh, A. (2021). Gender disparity in the digitalisation of financial services: Challenges and promises for women's financial inclusion in India. Gender, Technology and Development.

[17]. Liakos, K. G., Busato, P., Moshou, D., Pearson, S., & Bochtis, D. (2018). Machine learning in agriculture: A review. Sensors, 18(8), Article 2674. https://doi.org/10.3390/s18082674

[18]. Maheshwari, S., et al. (2025). Digital financial inclusion for rural women: Challenges and opportunities for sustainable development. Journal of Information and Optimization Sciences.

[19]. Majiwa, E., et al. (2026). Artificial intelligence (AI) adoption and its perceptions among smallholder women farmers in Kenya. Discover Agriculture.

[20]. Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. Entrepreneurship Theory and Practice, 41(6), 1029–1055. https://doi.org/10.1111/etap.12254

[21]. Rice, J. L., et al. (2023). Digital access opportunities for women's empowerment collectives: A theory of change based on social capital. The International Journal of Community and Social Development.

[22]. Sajanapwar, S., & Chandratreya, S. (2024). Empowering women through technology: The impact of digitisation on self-help groups. International Journal of Scientific Research in Engineering and Management.

[23]. Sajjad, M., Kaleem, N., Chani, M. I., & Ahmed, M. (2020). Worldwide role of women entrepreneurs in economic development. Asia Pacific Journal of Innovation and Entrepreneurship, 14(2), 151–160. https://doi.org/10.1108/APJIE-06-2019-0041

[24]. Sheeba, J. C., & Raj, S. (2024). Exploring female agripreneurship: Insights from grey literature using TCCM framework. International Journal of Experimental Research and Review.

[25]. Singh, S. (2026). Women-led agritech ventures: Business models, constraints and impact on households. International Journal of Integrative Studies.

[26]. Sutherland, W., & Jarrahi, M. H. (2018). The sharing economy and digital platforms: A review and research agenda. International Journal of Information Management, 43, 328–341. https://doi.org/10.1016/j.ijinfomgt.2018.07.004

[27]. Tzachor, A. (2021). Barriers to AI adoption in Indian agriculture. International Journal of Innovation in the Digital Economy.

[28]. Yomi, O. (2024). Assessing the impact of AI-powered agricultural extension systems on farm productivity and decision-making among smallholder farmers. Iconic Research and Engineering Journals.